

**Cerebrovascular Accidents-  
Brain Infarcts  
Abstracts from ACVIM 2004**

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Dr. LS Garosi from the Animal Health Trust in England presented 2 abstracts regarding brain infarction in dogs at the ACVIM meeting in 2004.

- Clinical characteristics and topographical magnetic resonance of suspected brain infarctions in dogs
- Results of diagnostic investigation and outcome of suspected and confirmed brain infarction in dogs

Basic summary of the first abstract found that brain infarctions are a cause of acute, non-progressive neurological signs in dogs. The infarcts cause clinical signs that are consistent with the neuroanatomic location of the lesion. The infarcts are typically non-hemorrhagic and non-contrast enhancing on MR imaging.

The majority of brain infarcts were found in the cerebellar region followed by the thalamic/midbrain and then cerebral region. The rostral cerebellar artery was associated with all of the cerebellar infarcts. The striate arteries and perforating arteries of the rostral brainstem were involved in the thalamic/midbrain infarcts. The middle cerebral and rostral cerebral arteries were associated with the cerebral infarcts.

None of the brain infarcts were hemorrhagic on MR imaging. The majority of infarcts were not contrast enhancing either. Only 3 cases had positive contrast enhancement and all 3 cases were imaged greater than 7 days after occurrence of clinical signs.

Neurological signs were consistent with the neuroanatomic location of the infarct.

Common signs associated with cerebral infarcts included:

Abnormal mentation, contralateral CP deficits, contralateral menace deficits and nasal hypalgesia, ipsilateral circling

Common signs associated with thalamic/midbrain infarcts included:

Contralateral or ipsilateral CP deficits, contralateral menace deficits, ipsilateral head turn, nystagmus, anisocoria, and ventrolateral strabismus

Common clinical signs associated with cerebellar infarcts included:

Ataxia, head tilt, intermittent opisthotonus, nystagmus, and ipsilateral menace deficits with intact vision

The second abstract was to determine the typical case signalment and medical conditions associated with brain infarctions, to identify associations between medical conditions and brain infarct types and locations, and to assess the outcome of dogs with brain infarcts.

All dogs in this study had either MR images consistent with brain infarction or confirmation on necropsy. The location of infarcts in descending order was cerebellar, thalamic/midbrain and then cerebral. All dogs in the study were evaluated with complete hematology, chemistry, thyroid, coagulation and adrenal profiles, urinalysis, thoracic and abdominal imaging and CSF analysis. Most dogs had arterial blood pressures measured.

They found no significant association between the location of the infarct and the age or sex of the dog, the presence of hypertension, CSF abnormalities, or presence or absence of an associated medical condition.

They did find that small breed (<15 kg) dogs were significantly more likely to have large cerebellar infarcts, and large breed (>15 kg) dogs were significantly more likely to have small thalamic/midbrain infarcts. Spaniels had a significant breed predisposition for cerebellar infarcts.

They detected an associated medical condition in 18/33 of the dogs. The two most common medical conditions were chronic renal disease and hyperadrenocorticism. Dogs with an associated medical condition were more likely to suffer from recurrent infarcts and were more likely to have a shorter lifespan.

Three of the dogs were euthanized due to lack of improvement in clinical signs and 7 were euthanized due to the severity of their associated medical condition. There was no association between location of infarct and outcome.

#### **VSH:**

Any dog with an acute onset of non-progressive intracranial signs is a candidate for having had a vascular accident. Diagnostics recommended always include a CBC, Chem, crypto, U/A, thoracic radiographs, abdominal ultrasound, and blood pressure. An MRI +/- CSF tap is recommended based on the results of the initial diagnostic tests.

The dogs are treated based on clinical signs with IV fluids, hand feeding, down dog nursing care, anti-vomiting drugs and meclizine. Other treatments depend on underlying or associated conditions and include diazepam, amlodipine, mannitol, lasix, and dex NaP.

Many of these dogs show signs of improvement over the first 3-5 days. Encouraging the owner to give the dog 1 week of time and nursing care is important. Do not jump to euthanasia right away just because the clinical signs look severe. An MRI will confirm the diagnosis, rule out other intracranial diseases, and be able to provide prognostic information. If owners decline diagnostic testing then time will generally tell if it is an infarct, as most of these dogs will show significant or complete improvement over 2-4 weeks.